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Mobile Payments for the Developing World

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Memorandum

TO: Thomas Smith, Senior Attorney, World Bank Payments Division
FROM: Sally Edwards, Junior Attorney, World Bank Payments Division
DATE: February 2020
RE: Mobile Payments for the Developing World

Please review the following material outlining the mobile payment systems for the developing world in an attempt to answer the following questions:

1. What type(s) of mobile payment system(s) should the World Bank encourage across its client countries and why?
2. What policy and other issues are relevant to determining whether a payment system is likely to operate effectively in specific client countries?
3. What are the main risks to users' funds stored within new mobile-payment systems to protect the user if the provider enters bankruptcy proceedings?
4. What policy issues arise when designing legal and regulatory strategies to address those risks?

Written by Jonathan Greenacre, Boston University, with comments received from Howell E. Jackson, James S. Reid, Jr., Harvard Law School, Margaret E. Tayar, Davis Polk & Wardwell, and Will Paterson, World Bank. This Case Note draws upon a range of Greenacre's work, including *What is the Role of M-Pesa in Kenya's Economy?* (current working paper), *The Roadmap Approach to Regulating Digital Financial Services*, 1 JOURNAL OF FINANCIAL REGULATION 298 (2015), *The Regulation of Mobile Money*, Oxford BLAVATNIK SCHOOL OF GOVERNMENT PATHWAYS FOR PROSPERITY COMMISSION ON TECHNOLOGY AND INCLUSIVE DEVELOPMENT (2018), and an upcoming book manuscript, *The Regulation of Mobile Money* (Cambridge University Press, forthcoming, 2020). Case development at Harvard Law School is partially funded by a grant from Dechert LLP. Cases are developed solely as the basis for class discussion. They are not intended to serve as endorsements, sources of primary data, legal advice, or illustrations of effective or ineffective management.

Introduction

The proliferation of mobile phones in the developing world is generating opportunities to provide payment services far beyond the banking system. Only 63% of people in developing countries have access to a bank account[1] but 78% own a mobile phone.[2]

Increasingly, non-bank firms are taking advantage of the growth of mobile phones to provide payment systems, including mobile money (particularly M-Pesa in Kenya), Alipay and, more recently, central bank currencies.

The World Bank wants to assist with the spread of new mobile payment systems among its client countries and to ensure that these payment systems are faster, cheaper and potentially safer than the cash-based payment systems typically used by low-income communities.

The World Bank needs to be consistent with several policy goals, including financial inclusion, to extend payment systems to those without a bank account, known colloquially as the "unbanked."[3] Financial inclusion is an important interest of the World Bank, because low-income communities, particularly the unbanked, appear better able to move out of poverty when they can access formal financial services.[4] Furthermore, financial inclusion is a policy goal for over 80 developing countries, making it important when considering policy trade-offs.[5]

In addition to financial inclusion, the World Bank is particularly concerned about the liquidity of payment providers and, as a consumer-protection issue, the protection of users' funds in the event of bankruptcy of such firms.[6]

The World Bank is also mindful of potential challenges that policymakers may face with implementing, monitoring, and supervising payment systems. In many developing countries, policymakers have resource constraints in relation to staffing, technology, and operating systems, impeding their ability to oversee existing payment and banking systems. Adopting new payment systems would put such constraints under additional pressure by requiring new regulatory and supervisory arrangements.

Certain new mobile payment systems have grown very quickly and realization of loss of value or liquidity risk may contribute to various forms of systemic risk. The World Bank is interested in learning more about the operation of potential systemic risks that could arise through the collapse of such mobile payment systems. The World Bank is also concerned that problems with insolvency regimes in many developing countries may mean that legal instruments used widely for new payment systems may have limited effectiveness. A key limitation with such regimes is their relative slow pace of operation. For example, the World Bank estimates that the average bankruptcy proceeding in sub-Saharan Africa takes three years.

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1 Asli Demirgüç-Kunt, Leora Klapper, Dorothe Singer, Saniya Ansar and Jake Hess, *World Bank Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*, WORLD BANK (2018).

2 Laura Silver, *Smartphone Ownership is Growing Rapidly Around the World, but Not Always Equally*, PEW RESEARCH CENTER (Feb. 5, 2019), https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/.

3 United Nations Secretary-General's Special Advocate for Inclusive Finance for Development, *The Imperative of Financial Inclusion*, UNSGSA (2015), *http://www.unsgsa.org/about/financial-inclusion* (last visited Sept. 29 2015).

4 For a discussion of the apparent poverty-alleviating benefits of M-Pesa, *see* Tavneet Suri and William Jack, *The Long Run Poverty and Gender Impacts of Mobile Money*, 354 SCIENCE, 1288 (Dec. 9, 2016).

5 *Alliance for Financial Inclusion Members*, ALLIANCE FOR FINANCIAL INCLUSION, https://www.afi-global.org/members/ (last visited Sept. 15, 2019). But consider that typically only developing countries are Members of the Alliance, which may point to differing attitudes between developing and developed countries.

6 For a discussion of risks to users' funds stored in the shadow payment system, *see* Dan Awrey and Kristin van Zwieten, *The Shadow Payment System,* 43 IOWA LAW SCH. JOUR. OF CORP. LAW 775, 779, 805-6 (Apr. 21, 2017).

The remainder of this memo outlines the basic operation of several particularly prevalent non-bank payment systems that have been launched or have been intended for launch in the developing and emerging regions of the world. These include M-Pesa in Kenya, Alipay in China, a central bank currency in Ecuador, and Facebook-backed Libra.

M-Pesa in Kenya

M-Pesa, launched in Kenya in 2007, is the world's first "mobile-money" service.[7] A customer converts cash for an electronic currency called "e-money" that is issued by Safaricom, a phone company operating as a subsidiary of Vodacom.[8] The customer performs this cash-in function at a "cash merchant," which is usually a corner store, post office, or another type of retail outlet. The cash merchant operates on behalf of Safaricom.[9] An M-Pesa account provides very similar functionality as a bank deposit—a customer can store their funds in the M-Pesa service; transfer e-money to other M-Pesa users through text messages on their mobile phone; and convert any remaining e-money in their account into cash at a cash merchant.

Cash merchants use their own reserves of e-money and cash for transactions rather than those of the phone company. To deposit funds into their account, a customer hands cash to the cash merchant. In return, the cash merchant uses the M-Pesa app on their mobile phone to send an equivalent amount of 'e-money' to the customer's M-Pesa account. A withdrawal transaction operates in reverse.

When a cash merchant needs additional e-money or cash, they transact with other actors in the M-Pesa system, particularly 'aggregators.' These are larger retail outlets, such as supermarkets, which store more substantial reserves of e-money and cash. To do so, the cash merchant and the supermarket exchange an equivalent amount of e-money for cash, much like a customer and a cash merchant. Aggregators themselves obtain additional e-money or cash from Safaricom.

M-Pesa grew rapidly, triggering the expansion of mobile money in Kenya and other developing regions. There are now around 26 million M-Pesa users in Kenya.[10] By 2018 there were 866 million mobile money accounts worldwide, overwhelmingly located in the developing world.[11]

Safaricom launched M-Pesa in a time of high financial exclusion with widespread use of cash by the unbanked and limited competition from other firms, particularly banks. In 2007, before the launch of M-Pesa, over 81% of the population did not have a bank account and tended to use cash-based payment systems.[12] Banking outreach was limited. Kenya had 3.4 bank branches per 100,000 people, significantly

[7] Timothy Lyman, Mark Pickens and David Porteous, *Regulating Transformational Branchless Banking*, CONSULTATIVE GROUP TO ASSIST THE POOR, (January, 2008), http://www.cgap.org/publications/regulating-transformational-branchless-banking, 1-24 (last visited Sept. 29, 2015).

[8] For the full definition of "e-money" *see* Mobile Financial Services Working Group, *Mobile Financial Services: Basic Terminology*, ALLIANCE FOR FINANCIAL INCLUSION (2013), http://www.afi-global.org/library/publications/mobile-financial-services-basic-terminology-2013 (last visited Sept. 29, 2015)): "A type of monetary value electronically recorded and generally understood to have the following attributes: (i) issued upon receipt of funds in an amount no lesser in value than the value of the e-money issued; (ii) stored on an electronic device (e.g. a chip, prepaid card, mobile phone, or computer system); (iii) accepted as a means of payment by parties other than the issuer; and (iv) convertible into cash." Note that in contracts between mobile money firms and customers, e-money is often defined as electronic monetary value depicted in the customer's mobile money account. For example, see the definition of "e-money" in Safaricom, *M-Pesa Terms and Conditions*, SAFARICOM https://www.safaricom.co.ke/images/Downloads/Terms_and_Conditions/CUSTOMER_TERMS_March_2012.pdf.

[9] Safaricom, *M-Pesa Agents*, SAFARICOM, https://www.safaricom.co.ke/personal/m-pesa/get-started-with-m-pesa/m-pesa-agents (last visited Nov. 8, 2014).

[10] Mutsa Chironga, Hilary De Grandis, and Yassir Zouaoui, *Mobile financial services in Africa: Winning the battle for the customer*, McKinsey & Company (Sept. 2017), https://www.mckinsey.com/industries/financial-services/our-insights/mobile-financial-services-in-africa-winning-the-battle-for-the-customer.

[11] Francesco Pasti, *State of the Industry Report on Mobile Money*, GSMA (2018), https://www.gsma.com/r/wp-content/uploads/2019/05/GSMA-State-of-the-Industry-Report-on-Mobile-Money-2018-1.pdf.

[12] Alliance for Fin. Inclusion, *The 2010 AFI survey report on financial inclusion policy in developing countries*, ALLIANCE FOR FINANCIAL INCLUSION (2010), https://www.afi-global.org/sites/default/files/publications/afi%20survey%20report%202010-en.pdf.

lower than the global average of 11.6 branches per 100,000 people.[13] In the same year, Kenya had 4.6 ATMs per 100,000 people against a global average of 18.9.[14]

Safaricom took advantage of the very rapid spread of mobile phones in Kenya and its role as a key provider of phone services. Between 2002 and 2006, the number of mobile phones in Kenya increased from 1 million to 10 million.[15] Many of these mobile phone subscribers had a pre-existing contractual relationship with Safaricom rather than a relationship with a bank. Furthermore, M-Pesa does not require a smartphone–it can operate effectively on a comparatively rudimentary 2G mobile phone.

Safaricom and the Central Bank of Kenya (CBK), the government agency ultimately responsible for the regulation of M-Pesa, also had specific goals for the service. The system was designed to specifically target unbanked communities and achieve financial inclusion. To that end, the service would complement, rather than substitute, the bank-based payment system. This meant that M-Pesa would be a vehicle for storing and transferring a small amount of funds. However, the Kenyan banking system would perform the majority of payments (namely, those involving larger amounts of funds) and provide credit creation in the economy.

To that end, M-Pesa also grew in a relatively liberal regulatory environment, in part because of the emphasis on financial inclusion. The CBK did not design extensive regulatory frameworks for the service until 2014–seven years after its launch. Until then, Safaricom was permitted to provide the service through contractual mechanisms only, subject to extensive CBK oversight, limiting regulatory costs it might have otherwise faced. Such supervision was relatively feasible for the CBK because M-Pesa involved relatively simple private law strategies to protect customers' funds against liquidity and bankruptcy risks. Customers' funds were stored in a trust (as a means of segregating such funds from assets of Safaricom) and placed in a bank (to reduce the marginal probability of liquidity and potential bankruptcy risk). In so doing, M-Pesa did not involve credit creation of the type that tends to attract more extensive regulatory and supervisory oversight. Instead, credit creation took place in the Kenyan banking system, which was already subject to prudential regulation and oversight.

This legal arrangement helps explain the mechanisms of deposit and withdrawal transactions. When depositing funds, a customer hands over cash and the cash merchant sends e-money to them, comprising a portion of their (the cash merchant's) beneficial interest in the M-Pesa trust fund. When withdrawing funds, the customer sends a portion of e-money (comprising a portion of their beneficial interest in the M-Pesa trust fund) to the cash merchant. In exchange, the cash merchant provides an equivalent amount of cash to the customer. Safaricom was also given broad regulatory freedom to design cash merchant arrangements that would help customers convert cash for so-called "e-money" and vice versa. Safaricom moved quickly to develop such arrangements and now has over 110,000 M-Pesa cash merchants across Kenya.[16]

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[13] The International Monetary Fund, Financial Access Survey, *Commercial Bank Branches (per 100,000 adults) - Kenya*, THE WORLD BANK, https://data.worldbank.org/indicator/FB.CBK.BRCH.P5?locations=KE (last visited Sept. 15, 2019).

[14] The International Monetary Fund, Financial Access Survey, *Automated Teller Machines (ATM's) (per 100,000 adults)*, THE WORLD BANK, https://data.worldbank.org/indicator/FB.ATM.TOTL.P5 (last visited Sept. 15, 2019).

[15] Harry McGee, *How the mobile phone changed Kenya*, THE IRISH TIMES (May 14, 2016), https://www.irishtimes.com/news/world/africa/how-the-mobile-phone-changed-kenya-1.2646968.

[16] Francois De Soyres, Mohamed Abdel Jelil, Caroline Cerruti and Leah Kiwara, *What Kenya's Mobile Money Success Could Mean For the Arab World*, THE WORLD BANK (Oct. 3, 2018), https://www.worldbank.org/en/news/feature/2018/10/03/what-kenya-s-mobile-money-success-could-mean-for-the-arab-world.

Since its launch, M-Pesa has encountered a range of regulatory and policy issues. For example, the amount of M-Pesa funds stored with the trust bank deposit (which is "pooled" and stores funds received from a large number of specific M-Pesa accounts) far exceeded Kenya's deposit-insurance ceiling and M-Pesa customers' funds are virtually completely uninsured against bank failure.[17] As a result, some countries have begun to explore the introduction of pass-through deposit insurance, whereby each mobile-money account pooled within the trust bank account receives the full protection of pass-through deposit insurance. For example, on January 18, 2016, the Nigeria Deposit Insurance Corporation announced that pass-through deposit insurance would be extended to mobile money, making Nigeria the first, and currently only, country to do so.[18] The system insures each individual mobile money account up to $3,255.[19] Such regulatory strategies would appear to give similar protection for mobile money as bank deposits.

Pass-through deposit insurance raises a broader question of supervisory capability of policymakers grappling with mobile money. A number of policymakers have expressed doubt about their ability to supervise pass-through deposit insurance given their pre-existing resource constraints.

The CBK had an advantage over policymakers in other countries because it could learn about mobile money from the very beginning of the evolution of M-Pesa.[20] These regulators were involved in the launch of mobile money from its beginning in 2007 and adopted a "test-and-learn" approach that allowed them to develop regulatory insights which could be applied and evolved as M-Pesa grew.[21] Other policymakers had to deal with potential entrants wanting to launch at scale, making the test-and-learn approach less feasible.

A related challenge for mobile money revolves around the relatively slow speed of bankruptcy regimes in many countries in which the service operates. In theory, the trust arrangement means customers' funds cannot be claimed by creditors and so are available for distribution to customers. However, this arrangement cannot, in itself, ensure that such funds will be returned quickly to customers. The World Bank estimates that the average bankruptcy proceeding in Kenya takes four and a half years.[22] Customers may face a long delay in receiving their funds if their funds have been deposited with a mobile-money service when it enters bankruptcy proceedings. It is not clear what type of accelerated bankruptcy regime could be used to address this problem, because such regimes are normally applied to banks and other types of financial intermediaries, not non-banks providing only payment services.

A number of other issues have arisen as M-Pesa and other mobile-money services have grown and spread to other countries. For example, civil-law countries have greater challenges segregating customers' funds from other assets of the relevant mobile-money firm, because such countries often do not have trusts and therefore require alternative legal tools.[23]

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[17] William G. Jack and Tavneet Suri, *The Economics of M-Pesa*, *Working Paper*, MASS. INST. OF TECH. (Aug. 2010), http://faculty.georgetown.edu/wgj/papers/Jack_Suri-Economics-of-M-PESA.pdf.

[18] Babajide Komolafe, *NDIC Issues Deposit Insurance Guidelines for Mobile Money*, VANGUARD (Jan. 18, 2016), http://www.vanguardngr.com/2016/01/ndic-issues-deposit-insurance-guidelines-for-mobile-money.

[19] Kingsley O. Nwaigwe (Deputy Director, Research Policy and International Relations Department, Nigeria), *Deposit Insurance and Mobile Money in Africa*, IADI Africa Regional Committee Conference, Zanzibar, Int'l Assoc. of Deposit Insurers (Sept. 1, 2016).

[20] *Id*.

[21] Njuguna Ndung'u, *Digital Technology and State Capacity in Kenya, Policy Paper 154*, CTR. FOR GLOBAL DEV. (AUG. 6, 2019), https://www.cgdev.org/publication/digital-technology-and-state-capacity-kenya.

[22] The World Bank, *Resolving Insolvency*, THE WORLD BANK (2018), https://www.doingbusiness.org/en/data/exploretopics/resolving-insolvency.

[23] David Ramos Munoz, Javier Solana, Ross Buckley and Jonathan Greenacre, *Protecting Mobile Money Customer Funds in Civil Law Jurisdictions*, 65 INT'L & COMP. L. Q. 705 (2016).

More generally, the service has struggled to grow in other countries, including some of the fastest-growing developing countries and emerging markets, such as India, Indonesia, Nigeria, Mexico, and South Africa.

A range of factors appears to impede the spread and growth of mobile money. One such factor is heavy regulation, including insistence on stringent know-your-customer (KYC) rules. The closer such rules resemble KYC requirements for bank deposits, the less of a cost advantage mobile money enjoys, prohibiting its ability to reach "down-market" and serve low-income and unbanked communities. Rules also require non-banks to partner with banks, and often the bank receives the relevant mobile-payment license. Such partnerships also introduce costs because non-banks must obtain bank approval before launching and growing products. Other countries with stronger competition from banks, manifested through lower percentages of unbanked populations, also appear to impede the growth of mobile money, as people can already access many of the features inherent in mobile-money platforms through their bank accounts or their specific bank app.[24] A recent study shows that the higher the average income of a developing country, the less likelihood that third-party mobile money platforms are successful.[25]

Alipay in China

Ant Financial is an affiliate company of the Alibaba group, focusing on fintech and whose primary product is the mobile-payment service Alipay. Like a bank deposit, Alipay operates as a mobile wallet with a number of in-app services which can be used to pay for a range of services, such as taxicabs, movie tickets, and utility bills.[26] The app can also be used to transfer money to other Alipay users.[27] Customers can deposit money in their Alipay wallets, which can then be used to purchase goods or services.[28] Ant Financial also launched its own virtual credit card, Huabei, as an add-on service for Alipay users.

Customers have two options when transferring their funds using the Alipay system. One is non-instantaneous in nature, *i.e.*, transactions take place after confirmation of satisfactory receipt of service or goods.[29] Until that point, the money is held in escrow. Alternatively, customers can elect for instantaneous payment where payments are quickly made, but funds are not stored in escrow.

To use Alipay, a customer opens an Alipay account on a mobile phone, which comes with an attached mobile wallet, and then uploads funds into their mobile wallet.[30] All money stored on the Alipay wallet account is stored on the Alipay system.[31] In accordance with the most recent direction of the People's Bank of China, any customer funds which are not immediately transferred to their bank accounts or used

[24] David S. Evans and Alexis Pirchio, *An Examination of Why Mobile Money Schemes Ignite in Some Developing Countries But Flounder in Most, Working Paper No. 723*, COASE-SANDOR INST. FOR L. AND ECON, UNIV. OF CHICAGO L. SCH. (March, 2015), https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=2413&context=law_and_economics.
[25] *Id.*
[26] Lily Kuo, *Digital Wallet' of Ant Financial Captivates China and beyond*, THE GUARDIAN (May 28, 2018), https://www.theguardian.com/technology/2018/may/28/digital-wallet-of-ant-financial-captivates-china-and-beyond.
[27] *Id.*
[28] Alipay, *Alipay Hong Kong Wallet Service Agreement*, ALIPAY (Aug. 2018), https://render.alipay.hk/p/s/hkwallet/agreement/service/agreed?_lang=en_us&chinfo=hk_portal#index.
[29] *Id.*
[30] *Id.*
[31] *Id.*

for a purchase must be stored in a dedicated custodial account in a commercial bank.[32] This is to protect customers' funds and to prevent any abuse or fraud.[33]

Alipay was first launched in 2004 as a payment mechanism for Taobao, the world's largest e-commerce marketplace. In 2010, Alipay became a third-party payment system enabling it to provide services to additional actors beyond Taobao. This practice gave Alipay the ability to serve the growing number of Chinese who are connected to the internet mainly through mobile phones.[34]

Alipay has grown significantly in China due to a number of reasons. Through particular legal arrangements, the service developed customers' trust about its reliability and security. One key mechanism involved holding customers' funds in escrow until the required transaction is complete. This mechanism helped address problems of fraud in China's e-commerce system, which was riddled with transactions in which customers were sold defective goods. Alipay overcame this issue by holding the payment in escrow until the customer indicated satisfaction with the purchase, which built the credibility of Taobao and Alipay.[35] Growing trust in online transactions, therefore, helped increase Taobao's and Alipay's business.

Alipay also enjoyed a lack of competition from banks and credit card companies in China. Credit and debit card penetration in China has been historically low.[36] Alipay facilitates payments without using cash, a credit card, or a debit card, which enabled China to leapfrog countries that relied on such instruments.

Alipay also benefited from the closed nature of China's internet system, which prevents ready access to local internet for non-Chinese companies. Stringent data-sharing norms, the lack of any privacy protections, censorship laws, and complex cybersecurity regulations serve as barriers to entry for non-Chinese firms.[37] Certain foreign firms have sought to navigate these challenges to invest in China but later withdrew. For example, Amazon entered China in 2004, but closed its operations in 2019.[38]

Alipay does not work on 2G mobile phones; instead, customers must use a smartphone, which enabled the Alipay service to grow because of the rapid expansion of smartphone users. China now has over 713 million smartphone users.[39]

Alipay also bundled together payment services with other financial services, particularly opportunities to access credit, to enable it to provide to customers a holistic set of financial instruments. Extension of formal credit has been comparatively low in China. In 2014, fewer than 10% of China's population had access to credit through a formal financial institution.[40] Ant Financial's credit and insurance products, offered through Alipay, bridge this gap by providing these products to anyone who has a mobile phone.

One product includes a low-cost health insurance product, dubbed "mutual protection," that covers the cost of treating 100 illnesses. The cost of the insurance is shared by all participants in the product with a

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[32] Gabriel Wildau, *Tencent and Alipay set to lose $1bn in revenue from payment rules,* FIN. TIMES (July 15, 2018), https://www.ft.com/content/b472f73c-859e-11e8-96dd-fa565ec55929.
[33] *Id.*
[34] Lerong Lu, *How a Little Ant Challenges Giant Banks? The Rise of Ant Financial's Fintech Empire and Relevant Regulatory Concerns*, INT'L CO. & COM. L. REV. (2018).
[35] Payments, *Alibaba: From Start to Now (And Wow)*, PYMENTS.COM (Sept. 18, 2014), https://www.pymnts.com/news/2014/alibaba-from-start-to-now-and-wow/.
[36] Lu, *supra* note 34.
[37] Assoc. Press, *Beijing Targets Foreign Firms In Internet Crackdown*, S. CHINA MORNING POST (July 20, 2017), https://www.scmp.com/news/china/policies-politics/article/2103458/beijing-targets-foreign-firms-internet-crackdown.
[38] Arjun Kharpal, *Amazon is shutting down Its China marketplace business. Here's why it has struggled*, CNBC (Apr. 18, 2019), https://www.cnbc.com/2019/04/18/amazon-china-marketplace-closing-down-heres-why.html.
[39] Lu, *supra* note 34.
[40] Lu, *supra* note 34.

cap of 188 yuan ($26) per month.[41] Customers can register for this product and make payments through the Alipay app.[42]

Ant Financial also offers an online cash management platform called Yu'e Bao, which is essentially a form of money market fund in which customers can invest through the Alipay platform.[43] This platform is directed primarily at people who have spare money in their Alipay wallets and it has grown to become the largest money-market fund in the world with assets of $233 billion.[44]

Compared to other developing countries, the People's Bank of China (PBOC), the Chinese central bank, has significantly greater institutional capability and the capacity to regulate new fintech products. The PBOC has taken a "wait-and-see" approach to Alipay and related products, enabling the bank to learn how they work and develop regulatory frameworks. For example, Alipay launched in 2004 and the PBOC did not institute regulations until 2010.[45] The PBOC developed additional regulations in 2019.[46] These regulations are not publicly available.

The sheer number of Alipay users and huge number of transactions raises complex questions around systemic risk. The service now involves one billion users worldwide with over 800 million citizens in China making 500 million transactions per day.[47] Chinese policymakers may need to determine whether Alipay is systemically important and, if so, what regulatory tools to use should it fail. These decisions are challenging partly because China's non-bank payment system is bigger than any other country and may take a form of systemic risk not seen in other jurisdictions. Furthermore, most international standards contain a central assumption that banks, not non-banks, provide payment systems, and international standards reflect this assumption. For example, the *Core Principles of Systemically Important Payment Systems* issued by the Bank for International Settlements in 2001 (BIS Principles) assume that banks, not non-banks, provide the accounts through which payments are made.[48] The BIS Principles then focus on systemic risk as taking the form of a contagion between banks and, through them, the stability of the system on financial markets.[49] Other international standards make similar assumptions.[50]

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[41] Shu Zhang, *China's Ant Financial amasses 50 million users, mostly low-income, in new health plan*, REUTERS (Apr. 12, 2019), https://www.reuters.com/article/us-china-ant-financial-insurance/chinas-ant-financial-amasses-50-million-users-mostly-low-income-in-new-health-plan-idUSKCN1RO0H5.

[42] *Id.*

[43] Georgina Lee, *China's giant Yu'e Bao money market fund riskier than US rival, Fitch says*, S. CHINA MORN. POST (Dec 15, 2017), https://www.scmp.com/business/money/markets-investing/article/2124465/chinas-giant-yue-bao-money-market-fund-riskier-us.

[44] *Id.*

[45] Lu, *supra* note 34.

[46] Jason Lee, *China's central bank says will gradually set up rules to regulate fintech*, REUTERS (Mar. 16, 2019), https://www.reuters.com/article/us-china-pboc-fintech/chinas-central-bank-says-will-gradually-set-up-rules-to-regulate-fintech-idUSKCN1QX05V.

[47] Tingyi Chen, *The cross-border payment war of WeChat Pay and Alipay*, WALKTHECHAT (Feb. 25, 2019), https://walkthechat.com/the-cross-border-payment-war-of-wechat-pay-and-alipay/.

[48] Comm. on Payment & Settlement Sys., *Core Principles for Systemically Important Payment Systems*, Bank for Int'l Settlements ¶ 1.1, ¶ 3.0.1 (Jan. 2001), http://www.bis.org/cpmi/publ/d43.pdf (last accessed Apr. 8 2016) (defines payment systems "as the means by which funds are transferred among banks").

[49] Id at ¶ 3.0.1, defines "systemic risk" as "[T]he risk that the inability of one of the participants to meet its obligations, or a disruption in the system itself, could result in the inability of other system participants or of financial institutions in other parts of the financial system to meet their obligations as they become due. Such a failure could cause widespread liquidity or credit problems and, as a result, could threaten the stability of the system or of financial markets."

[50] In particular, international standards have been issued at the level of the Financial Stability Board, Basel Committee on Banking Supervision, and International Organization of Securities Commission to identify systemic firms. Such forms can take the form of banks, traders, shadow banks, market infrastructure providers or any other type of institution. *See, e.g.*, Werner Bijkerk, Shane Worner, Rohini Tendulkar, Siddhartha Sanghi, *Systemic Risk Identification in Securities Markets*, Int'l Org. of Sec. Comm. 53 (2012); *see* Bank for Int'l Settlements, *Global Systemically Important Banks: Assessment methodology and the Additional Loss Absorbency Requirement*, (Nov. 2011) Fin. Stab. Bd., Int'l Monetary Fund, Bank for Int'l Settlement, *Guidance to Assess the Systemic Importance of Financial Institutions, Markets and Instruments: Initial Considerations*, (Oct. 2009); Financial Stability Board, Int'l Monetary Fund, Bank for Int'l Settlement 3; and Basel Comm/ on Bank'g Supervision, *'A Framework for Dealing with Domestic Systemically Important Banks*, BASEL COMM. ON BANKING SUPERVISION 2.

Policy questions are also informed by other policy objectives for Chinese regulators. Financial inclusion has been a stated objective and there has been recognition that Alipay's model has the potential to further this goal.[51] The PBOC has revealed that it intends to utilize fintech platforms like Ant Financial to enhance the flow of credit and reduce finance costs for businesses.[52] However, it remains unclear whether Ant Financial's products actually do help in extending financial inclusion, especially in rural areas, and what role the PBOC envisages such systems will play in reaching its goal of financial inclusion.[53] While there is not much public information about the PBOC's thinking on this issue, given the size and potential of Ant Financial and its products, there cannot be any doubt about the apparent importance of Ant Financial to the PBOC's financial-inclusion goals.

Ant Financial's products, especially Alipay, are being increasingly accepted outside China. Alipay is now available in 54 international markets, most of which are in the West and in Southeast Asia. Ant Financial's success in reaching these markets is driven primarily by the need to cater to Chinese tourists who are now the biggest global spenders.[54] Acceptance of Alipay's payment mechanism allows local businesses in these countries to readily attract Chinese tourists. Another factor for the growth of Alipay's platforms, especially within countries in The Association of Southeast Asian Nations (ASEAN), is the presence of large Chinese diasporas cropping up in the countries of this region and more individuals using Ant Financial's products to transact with their families back in mainland China.[55] Ant Financial has also been exporting its model to other countries, primarily through investments in similar financial products like PayTM in India.[56] It is unclear whether Ant Financial will be able to grow in other countries at a similar rate as in China. Ant Financial will not enjoy the restrictions on investment that make it costly for non-Chinese companies, particularly technology firms such as Amazon and Google, to succeed in the Chinese market.

Central Bank Currency in Ecuador (2014 to 2017)

In the past few years, central banks across the world have shown a growing interest in introducing central-bank backed digital currencies. This interest has been driven by two considerations—first, the perceived need to compete with independent cryptocurrencies like Bitcoin and Libra, which could theoretically undercut the power of central banks globally;[57] and second, the goal of financial inclusion, in which digital currencies are often seen as a cost-effective means of increasing access to formal financial services.[58]

As currently designed, a centrally-backed digital currency would involve two components—first, the currency itself, a digital equivalent of the domestic fiat currency (for example, a digital dollar) which can be used to transact online; and second, a means to use this currency, normally in the form of a digital wallet or a specific digital currency account, where the currency would be stored and transactions can occur primarily through the use of mobile phones.[59]

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[51] Douglas Randall and Jennifer Chien, *Fintech As A Pathway to Financial Inclusion? The Case of China*, FINDEV GATEWAY (April 2018), https://www.findevgateway.org/blog/2018/apr/fintech-pathway-financial-inclusion-case-china.
[52] *Id.*
[53] Tyler Aveni and Joep Roest, 2017. *China's Alipay and WeChat Pay: Reaching Rural Users, CGAP Brief*, WORLD BANK (2017), https://openknowledge.worldbank.org/handle/10986/30112.
[54] John Detrixhe, *China's Ant Financial, thwarted in the US, is expanding rapidly in Europe*, QUARTZ (Mar. 15, 2019), https://qz.com/1570052/ant-financials-alipay-is-expanding-rapidly-outside-of-china/.
[55] *Id.*
[56] Simon Mundy, *Alibaba to invest $177 M in India's Paytm*, FIN. TIMES (Mar. 2, 2017), https://www.ft.com/content/5cbb69bf-a2ae-3288-8500-27656a12067b.
[57] Morten Linnemann Bech and Rodney Garatt, *Central Bank Cryptocurrencies*, BANK FOR INTL SETTLEMENTS Q. REV. (Sept. 17 2017), https://www.bis.org/publ/qtrpdf/r_qt1709f.htm.
[58] *Id.*
[59] *Id.*

Ecuador's government became interested in the introduction of a central bank currency—later termed Dinero Electronico (DE)—for reasons that are not immediately clear. It appears that financial inclusion was not directly relevant, even though this is a policy goal of Ecuador.[60] Some commentators have argued that the DE was a way to de-dollarize the economy. Ecuador was forced to fix the value of the Sucre (the local currency) to the U.S. dollar during a period of hyperinflation in 1999.[61]

In September, 2014, the Banco Central de Ecuador (BCE) launched DE and people could spend money in their accounts by February 2015.[62] However, the electronic money system was decommissioned in 2017.[63]

DE was designed to substitute digital currency for physical currency. Users needed to create special accounts to use the currency, which would be kept on the central bank's own balance sheet, and transfer the currency using a mobile phone app. To actually use DE, people would get special accounts registered with the BCE itself, which could be accessed and used using a mobile phone.[64] Use of DE was voluntary.

Mobile money and third-party platforms such as Alipay work within existing financial and monetary systems, whereas DE more fundamentally affected Ecuador's financial system. Policies towards DE affected the monetary policy of Ecuador, involving the regulation of money supply in the entire economy, and not any sector-specific regulations.[65]

More directly relevant, storing funds within the Ecuadorian central bank created a different risk profile than that of M-Pesa and Alipay. In theory, risks from bankruptcy are removed entirely, or at least as far as the credit rating of the Ecuadorian central bank. However, customers' funds continue to be exposed to inflation, foreign exchange risk, and appropriation by the Ecuadorian state. The Ecuadorian government established the Monetary and Financial Council to regulate the supply and use of DE, though the exact legal arrangements used to protect funds are unclear.[66]

A number of factors appeared to impede the use of DE, leading to its withdrawal three years after its launch. Its voluntary nature meant there was no immediate incentive for anyone in the country to begin using the currency.[67] Consequently, DE needed to demonstrate its value to generate the network effects required for sustainable usage and growth of the currency. Several features impeded the perceived safety and ultimate usefulness of DE. One of these was the lack of credibility of government-backed financial products, given the number of times the government of Ecuador defaulted on its bonds since 2000.[68] Furthermore, DE accounts were not denominated in Ecuador's domestic-fiat currency. Instead, the BCE issued claims to U.S. dollars that it might not be able to repay.[69] Without the necessary uptake in usage, the cost of upkeep and maintenance of the currency also proved to be prohibitively expensive for the BCE, with the organization losing money every day of the currency's operation.[70]

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60 Larry White, *The World's First Central Bank Electronic Money Has Come - And Gone: Ecuador, 2014-18*, ALT-M (Mar. 29, 2018), https://www.alt-m.org/2018/03/29/the-worlds-first-central-bank-electronic-money-has-come-and-gone-ecuador-2014-2018/.
61 *Id.*
62 Detrixhe, *supra* note 53.
63 *Id.*
64 *Id.*
65 *Id.*
66 Carlo C, *Ecuador's National Digital Currency Experiment Explained*, COINTELEGRAPH (Oct. 23, 2014), https://cointelegraph.com/news/ecuadors-national-digital-currency-experiment-explained.
67 Detrixhe, *supra* note 53.
68 *Id.*
69 *Id.*
70 *Id.*

The BCE also faced significant policy and supervisory limitations which reduced the credibility of DE.[71] This is due to the perceived lack of independence of the central bank from the Ecuadorian government, with appointments to the BCE being seen as completely political. There was no faith in the government bank because of its previous defaults on its liabilities, the most recent being in 2008, but with eight previous defaults, including defaults in 1982, 1984, and 2000.[72]

The Ecuador government's attempt to enter the mobile banking market exemplifies the challenges of a "one-size-fits-all" model to address the needs of individual countries.

Central Bank Digital Currencies

The relatively recent advent of international policy discussions around central bank currencies highlights the range of unresolved legal and regulatory issues. One of these is the desired relationship between the new currency and the central bank's monetary policy, and its relationship to bank deposits. For example, would the currency carry interest? Would the users be required to hold accounts with the central bank or could they remain anonymous? Would any restrictions be imposed on the size of the users' balance and transactions?[73] Should these be set at a higher or lower level than bank deposits? Digital currencies may be more likely to emerge in instances in which the banking system is more trusted than the central bank and government, and takes the lead on distributing such currencies.[74]

A second issue is the relationship between the digital currency and existing physical currency. Supply of currency normally is tightly regulated to maintain its value and prevent undue inflationary tendencies. If a digital currency were to be issued alongside physical currency, the ratio of each would need to be determined within the context of a country's monetary policy.[75] Any central bank would therefore need to determine if the digital currency will be inferior to the physical currency or will eventually replace all physical currency.

A third set of issues revolve around the exact nature of the currency itself. Because of its digital nature, it could either be treated as a cash-like physical currency, or some form of a deposit.[76] Each of these comes with its own benefits and costs but will ultimately mean that digital currencies may differ between countries and make cross-border transactions more difficult.

Other developing countries have not adopted central bank-backed digital currencies. The only exception is Uruguay, which launched a pilot project in 2017. The project was abandoned after six months and there is no publicly available information about the results of the project or the reasons that the currency did not grow as desired.[77]

However, digital currencies may become more prevalent in the future in response to developments in China, which has been researching the possibility of launching its own digital currency since 2014, but has

[71] *Id.*
[72] Naomi Mapstone, *Ecuador defaults on sovereign bonds*, FIN. TIMES (Dec. 12, 2008), https://www.ft.com/content/7170e224-c897-11dd-b86f-000077b07658.
[73] Todd Keister and Daniel Sanches, *Should Central Banks Issue Digital Currency? Working Paper 19-26*, FED. RES. BANK OF PHIL. 4 (June 2019), https://philadelphiafed.org/-/media/research-and-data/publications/working-papers/2019/wp19-26.pdf.
[74] *Id.*
[75] *Id.*
[76] *Id.*
[77] *Id.*

accelerated its efforts in response to Facebook's proposed currency, Libra.[78] There is very little information about the proposed Chinese currency apart from the fact that it will be powered partially through blockchain and will be dispersed through digital wallets.[79] The currency is also designed in a manner that will allow the central bank to track the movement of the currency and supervise transactions.[80]

We have been looking at the protection of funds stored in specific services. Eventually, if these specific services take off, policymakers will need to work out whether and, if so, how to make them interoperable – namely payments from one type of service (e.g. M-Pesa) made to another (e.g. to a bank account or Ant Financial account). Other countries will eventually need to work out what path to take at that juncture.

For example, India's Unified Payments Interface (UPI), which is designed to facilitate interoperable payments and effectively connects different payments systems, has grown quickly since it was launched in 2016 by the National Payments Corporation of India, a non-profit that is owned by India's central bank, the Reserve Bank of India, and private commercial banks.[81] The Reserve Bank of India also regulates UPI. Transfers through UPI are instantaneous and costless. And unlike Alipay, for example, UPI's open architecture allows any regulated payment service provider to use it to transfer funds between individuals and/or businesses, and FinTechs and other companies can provide UPI services through regulated payment service providers.[82] UPI's open interface also allows users to more easily manage transactions across different accounts, institutions and systems using a single bank or payments application.[83]

A unique feature of UPI, and India's digital financial infrastructure more generally, is its utilization of unique biometric identification numbers, known as Aadhaar numbers; for example, users of UPI may transfer funds using their Aadhaar number (but may also make transfers using other identification numbers).[84] In order to receive an Aadhaar number, individuals must submit basic information (e.g., name, address), a face photograph as well as certain biometric information (e.g., fingerprints, iris scans). Thus, this biometric identification program allows for authentication through an Aadhaar app and helps facilitate electronic KYC, among other things.[85] A biometric identification program presents challenges, such as those regarding data privacy, however, and other countries may not be able or politically willing to launch one.

Libra

Libra is a proposed digital currency built using blockchain technology. The Libra Association, an association established by Facebook to oversee Libra, released its first white paper outlining the proposed

[78] Brenda Goh and Samuel Shen, *China's proposed digital currency more about policing than progress*, REUTERS (Nov. 1 2019), https://www.reuters.com/article/us-china-markets-digital-currency/chinas-proposed-digital-currency-more-about-policing-than-progress-idUSKBN1XB3QP.
[79] *Id.*
[80] *Id.*
[81] Saritha Rai, Google, Walmart Help Drive India Payments Past 1 Billion Transactions, Bloomberg (Nov. 1, 2019), https://www.bloomberg.com/news/articles/2019-11-01/google-walmart-drive-india-payments-past-1-billion-transactions.
[82] Derryl D'Silva, Zuzana Filková, Frank Packer and Siddharth Tiwari, *The design of digital financial infrastructure: lessons from India*, BANK OF INTERNATIONAL SETTLEMENTS (Dec. 2019), https://www.bis.org/publ/bppdf/bispap106.htm.
[83] *Id.*
[84] *Id.*
[85] *Id.*

Libra architecture and its uses in June 2019.[86] Under the first white paper, the Libra Association's proposed currency[87] would be backed by a basket of currencies and short-term government securities.[88] Unlike Bitcoin, for example, Libra coin would not be mined but just issued by the Libra Association and bought directly by consumers through Facebook's Calibra wallet platform or partner platforms. It could then be redeemed anywhere in the world online on any service that accepts Libra, as long as a person has a smartphone and an internet connection. The Libra Association's first white paper envisioned a new global currency that would be more stable and easier to exchange across the world.

The Libra Association's first white paper raised a number of important and contentious issues. First, all modern currencies are "fiat" currencies, in that they are valuable because of backing from their respective sovereign governments. If Libra became a global standard currency, its relationship with fiat currencies would become a significant issue, as it could reduce the current power of these currencies, and with it undermine the very idea of national sovereign governments.

Second, all national currencies are issued by their respective central banks and their money supply is tightly regulated, subject to national monetary and fiscal policies. These, in turn, are closely linked to domestic issues such as inflation. While the regulators in the central banks themselves are unelected, in theory they are generally answerable to the governments of the country which, in turn, are answerable to the people. A global currency issued and run by a non-government body backed by a company with the reach and power of Facebook raises questions about potential systemic financial risks that would otherwise be addressed by national governments.[89]

Third, the first Libra white paper argued that Libra would be far more stable than traditional currencies because it will be backed by a basket of financial instruments, including a basket of currencies, and U.S. treasury securities. However, these instruments and currencies themselves are subject to volatility and market shocks, which might affect the stability of Libra.[90] This, too, could pose significant systemic financial risks without sufficient regulatory oversight.

Finally, the Libra system could also potentially undermine the centrality of banks in the financial system, the vitality of which depends on banks meeting policy and regulatory requirements such as cash reserve ratios.[91] This, in turn, controls the flow of liquidity in the market. Libra exists independently of such requirements, lowering the cost of financial transactions through its network, and possibly marginalizing the role of banks, at least in relation to payment systems.[92] Libra could also cut out banks as intermediaries

[86] Libra Association Members, White Paper, An Introduction to Libra, v1.0 (Jun. 2019). https://libra.org/en-US/wp-content/uploads/sites/23/2019/06/LibraWhitePaper_en_US.pdf

[87] Commentators opine that Libra is not a cryptocurrency or currency, but merely a medium of exchange. *See*, Examining Facebook's Proposed Cryptocurrency and Its Impact on Consumers, Investors, and the American Financial System, Hearing before the H. Comm. on Financial Services 116th Cong. (July 17, 2019) (testimony of Meltem Demirors, Chief Strategy Officer of CoinShares, a digital sset management firm), https://www.equities.com/news/libra-is-not-a-cryptocurrency.

[88] Libra Association Members, White Paper, An Introduction to Libra, v1.0 (Jun. 2019). https://libra.org/en-US/wp-content/uploads/sites/23/2019/06/LibraWhitePaper_en_US.pdf

[89] Rohan Grey, *Facebook Wants Its Own Currency. That Should Scare Us All.*, THE NATION (July 22, 2019), https://www.thenation.com/article/facebook-libra-currency-digital/.

[90] Ely, B., Facebook's Libra Will Be A Nonstarter, *The Hill*, (June 24, 2019), https://thehill.com/opinion/finance/450019-facebooks-libra-will-be-a-nonstarter.

[91] Panos Mourdoukoutas, *Why Big Governments and Central Banks Want to Kill Libra and Bitcoin*, Forbes (July 16, 2019), https://www.forbes.com/sites/panosmourdoukoutas/2019/07/16/why-big-governments-and-central-banks-want-to-kill-libra-and-bitcoin/#1f055db838d5.

[92] David Z. Morris, *Facebook's Libra Currency Could Threaten the Global Financial System. Here's How*, FORTUNE (July 18, 2019), https://fortune.com/2019/07/18/facebook-libra-cryptocurrency-washington-hearings-financial-system/.

with the central banks, the financial system, and the larger population by making it convenient for people to transact on the Libra system, as opposed to the traditional banking channels.[93]

Facing significant regulatory pressure, the Libra Association released a second white paper in May 2020 that scales back on its vision for Libra and instead proposes a series of single-currency stablecoins in addition to a multi-currency Libra coin that is composed of fixed amounts of single-currency stablecoins.[94] Each of the Libra single-currency stablecoins will be fully backed by a reserve consisting of cash or cash equivalents and short-term government securities denominated in the relevant currency, and the multi-currency Libra coin will be composed of single-currency stablecoins. This design change was intended to address concerns that the Libra system could interfere with monetary sovereignty and monetary policy if it grew large enough.

Conclusion

The proliferation of mobile phones in the developing world has spurred the development of a number of mobile-payment providers and is generating opportunities to provide payment services far beyond the traditional banking system.

The World Bank will be diligent in determining the type(s) of mobile payment system(s) which should be encouraged, the policy and other issues relevant to determining whether a payment system is likely to operate effectively, the main risks to users' funds and methods available to protect the user from these risks, and the policy issues which may arise when designing legal and regulatory strategies to address those risks.

The World Bank wishes to encourage and assist in bringing mobile payment systems that are as safe or safer than current cash-based payment systems to provide the unbanked or underbanked a vehicle to improved economic circumstances.

[93] *Id.*

[94] Libra Association Members, White Paper, An Introduction to Libra, v2.0 (Apr. 2020). https://libra.org/en-US/wp-content/uploads/sites/23/2020/04/Libra_WhitePaperV2_April2020.pdf

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